

CURRICULUM VITAE

Eoin L. Brodie
Staff Scientist

Ecology Department
Earth Sciences Division
Lawrence Berkeley National Laboratory
MS 70A-3317
Berkeley, CA 94720

Phone: (510) 486 6584; E-mail: ELBrodie@lbl.gov; Web: http://www-esd.lbl.gov/ESD_staff/brodie/

Education and Training

B.S. Microbiology, University College Dublin, Ireland	1996
Ph.D. Microbial Ecology, University College Dublin, Ireland	2001
Postdoctoral, Microbial Ecology, University of California, Berkeley	2002-2004
Postdoctoral, Molecular Microbiology, Lawrence Berkeley National Laboratory	2004-2005

Research and Professional Experience

Staff Scientist, Lawrence Berkeley National Lab	2009-present
Research Scientist, Lawrence Berkeley National Lab	2008-2009
Scientific Engineering Associate, Lawrence Berkeley National Lab	2005-2008
Postdoctoral Research Fellow, Lawrence Berkeley National Lab	2004-2005
Guest lecturer UC Berkeley (ESPM131, ESPM112)	2002-present
Postdoctoral Research Fellow, University of California, Berkeley	2002-2004
Enterprise Ireland Graduate Research Fellowship, University College Dublin	1996-2000

Honors and awards

R&D 100 award for Berkeley Lab PhyloChip	2008
Wall Street Journal Technology Innovation Award (PhyloChip)	
- Winner Best New Technology (Environment Category)	2008
- Bronze Best New Technology (Overall)	2008
Pollution Engineering Magazine Number 1 New Technology for 2008 (PhyloChip)	2008
Promega Prize, Society for General Microbiology.	2001
Faculty of Science Graduate Symposium, UC Dublin.	2000
Enterprise Ireland Basic Research Award	1996-1999

Service to scholarly journals

Reviewer for:	
Chemosphere and Journal of Microbiological Methods (Elsevier)	2004-present
Geomicrobiology Journal (Taylor and Francis Group)	2006-present
Ecological Letters, Molecular Ecology Notes,	2006-present
Ground Water Monitoring and Remediation (all Blackwell Publishing)	
Microbial Ecology (Springer)	2004-present
Environmental Science and Technology (ACS Publications)	2006-present
Environmental Science and Pollution Research (Ecomed Verlagsgesellschaft)	2007-present
Journal of Proteome Research (ACS Publications)	2008-present
ISME Journal (Nature Publishing Group)	2009-present

Other Professional activities

Current member of the 'greengenes' 16S rRNA database development team	2004-present
Co-developer of the Berkeley Lab PhyloChip and MycoChip	2004-present

Sessions convened at national meetings

"From Black Box to Can of Worms: Advances in Molecular Analysis of Microbial Communities"
American Geophysical Union Fall Meeting December, San Francisco, December 2007.
"Beyond the Black Box: Integrating Advanced Microbial Characterization Data with Subsurface

Reactive Transport Models", Computational Methods in Water Resources, XVII, San Francisco, July 2008.

Proposal reviewing activities

Reviewer for Department of Energy:

Experimental Program to Stimulate Competitive Research 2007-

Reviewer for United States Department of Agriculture:

NRICGP Soil Processes program 2008-

NSF - Geobiology and Low-Temperature Geochemistry Program 2009-

Invited panelist

National Science Foundation: "Microscale Approaches to Macroscale Issues in Terrestrial Ecosystem Ecology", Washington DC, April 2007.

Department of Energy: "Carbon cycling and biosequestration", Rockville, MD, March 2008.

Invited presentations

"Are There Predictable Soil Microbial Community Responses to Climate Change?" Subsurface Biosphere Initiative seminar series, College of Oceanic and Atmospheric Sciences, March 2009, Oregon State University, Corvallis, OR.

"PhyloChip: A high-density phylogenetic microarray for analysis of microbial community composition and activity". Invited presentation. Plant and Animal Genome XVII Conference, January 2009, San Diego, CA.

"Teasing apart a microbes life with help from the molecular toolbox". Invited Plenary Presentation at NSF sponsored workshop "Microscale Approaches to Macroscale Issues in Terrestrial Ecosystem Ecology" April 2007, Washington DC.

"Molecular Tools in Environmental Microbiology". Invited presentation. April 2007, Adjuntas, PR. Advances in Environmental Remediation, Instituto Comunitario de Biodiversidad y Cultura Casa Pueblo de Adjuntas, Programa de Biotecnología Industrial, Universidad de Puerto Rico – Mayaguez.

"Characterization and monitoring of prokaryotic communities using phylogenetic high density DNA microarrays (PhyloChip)". Invited presentation. April 2007, Adjuntas, PR. Advances in Environmental Remediation, Instituto Comunitario de Biodiversidad y Cultura Casa Pueblo de Adjuntas, Programa de Biotecnología Industrial, Universidad de Puerto Rico – Mayaguez.

"Microbial detection technologies using genetic signatures". March 2007, Berkeley, CA. ASTAR Advanced Judicial Institute on Nanotechnology, Synthetic Biology and Environmental Biotechnology Platform B Workshop.

"Case Study: Monitoring aerosols for intentional release of agents: Tularemia fatality". March 2007, Berkeley, CA. ASTAR Advanced Judicial Institute on Nanotechnology, Synthetic Biology and Environmental Biotechnology Platform B Workshop.

"Integration of the Omics, Bioinformatics and Biogeochemistry: A New Frontier for Environmental Biotechnology" at Battelle International Meeting on Remediation of Chlorinated and Recalcitrant Compounds, Monterey, CA May 2006.

"Advances in Bioremediation of Soils and Sediments Polluted with Metals and Radionuclides: Field Research on Bioremediation of Metals and Radionuclides" also at Battelle International Meeting on Remediation of Chlorinated and Recalcitrant Compounds, Monterey, CA May 2006.

"High Density Microarrays for Microbial Population Dynamics" presented to University of California, San Francisco, Department of Anesthesia and Perioperative Care and the Pulmonary

and Critical Care Division, CA June 2006.

Membership in professional societies

Member of the American Society for Microbiology, American Geophysical Union, International Society for Microbial Ecology, International Society for Subsurface Microbiology.

Teaching activities

Regular guest lecturer at University of California, Berkeley, Department of Environmental Science Policy and Management and Microbial Biology Program (Soil Microbiology, ESPM131; Microbial Ecology, ESPM112)

Research supervision

Graduate students

Co-supervisor of UC Berkeley doctoral candidate Rebecca Daly from March 2006 to completion of dissertation (expected completion date 2011). Researching microbial community interactions during reductive immobilization of heavy metals and radionuclides.

Research mentor to UC Berkeley doctoral candidates Eric Dubinsky (2004 to 2007), Kristen DeAngelis (2006 to 2007), David Johnson (2005 to 2007), Christine Sun (2006 to 2007), Karellyn Cruz (2005 -present), Patrick Lee (2006 to 2008), Kimberlee West (2006 -present), Sarah Placella (2005 -present), Kelly Wrighton (2006 -present), Nhu Nguyen (2006 -present). Research mentor to Scripps Institution of Oceanography student Alex Hangsterfer (2008-present).

Mentor for graduate fellow (Catherine Fontana, Albion College, MI) through the DOE SURE GCEP summer fellowship program (2008) and Chris Lambert (2009).

Postdoctoral fellows

Xavier Mayali (2009-present), Ulas Karaoz (2008-present), Ruyang Han (2008-present), Holly Ganz (UC Berkeley, 2007-present).

Visiting faculty

Mentor for Faculty (Arturo Massol) from the University of Puerto Rico through the DOE/NSF FaST program (June-August 2006). Steven Wakelin (CSIRO Australia, July 2008).

Undergraduate students

Supervisor of UC Berkeley undergraduate student interns, Seung Baek (2003-2005), Calvin Myint (2005-2006), Byron Ma (2007-2009).

Mentor for undergraduate students from the University of Puerto Rico through the DOE/NSF FaST program (June-August 2006).

Mentor for undergraduate interns through the DOE CSEE and GREF programs (2006-present).

High school students

Mentor for high school students through the DOE SULI and LBNL HSSRPP programs (2006-present).

Peer Reviewed Publications (34 published, 1 in review). H-index (01/06/09) = 13

1. Kuramae, E.E., Gamper, H. A., Yergeau, E., Piceno, Y.M., **Brodie, E.L.**, DeSantis, T.Z., Andersen, G.L., van Veen, J.A., and G.A. Kowalchuk. Microbial diversity declines with secondary succession in grassland soil. In review PNAS.
2. Cruz, K., Suttle, K.B., **Brodie, E.L.**, Power, M.E., Andersen, G.L. and J.F. Banfield. 2009. Soil microbial communities show higher resilience than overlying grassland to effects of changing climate. ISME J. 3: 738-744.
3. Sunagawa, S., DeSantis, T.Z., Piceno, Y.M., **Brodie, E.L.**, DeSalvo, M.K., Voolstra, C.R., Weil, E., Andersen, G.L. and M. Medina. 2009. Bacterial Diversity and White Plague Disease-

Associated Community Changes in the Caribbean Coral Montastraea faveolata assessed by 16S rRNA Microarray Analysis and Clone Library Sequencing. ISME J. 3: 512-521.

4. Shawkey, M.D. Firestone, M.K., **Brodie, E.L.** and S.R. Beissinger. 2009. Avian Incubation Inhibits Growth and Diversification of Bacterial Assemblages on Eggs. PLoS ONE 4(2): e4522.
5. Fan, T.W-M., Bird, J.A., **Brodie, E.L.**, Firestone, M.K., Lane, A.N. and R. M. Higashi. 2009. 13C-Isotopomer-based Metabolomics of Microbial Groups Isolated from Two Forest Soils. Metabolomics Journal, 5: 108-122.
6. DeAngelis, K., **Brodie, E.L.**, DeSantis, T.Z. Andersen, G.L., Lindow, S., and M.K. Firestone. 2009. Selective progressive response of soil microbial community to wild oat roots. Advance online publication, ISME J, 3: 168-178.
7. Yergeau, E., Schoondermark-Stolk, S.A., Déjean, S., DeSantis, T.Z., **Brodie, E.L.**, Gonçalves, O., Piceno, Y.M., Andersen, G.L. and G. A. Kowalchuk. 2008. Application of a 16S rRNA gene-based microarray to explore Bacterial and Archaeal diversity and community composition in soil environments of Antarctica. Advance online publication ISME J 3: 340-351.
8. Tokunaga, T.K., Wan, J., Kim, Y., Daly, R.A., **Brodie, E.L.**, Hazen, T.C., Herman, D. and M. K. Firestone. 2008. Influences of Organic Carbon Supply Rate on Uranium Bioreduction in Initially Oxidizing, Contaminated Sediment. Environmental Science & Technology, 42:8901-8907.
9. Faybushenko, B., Hazen, T.C., Long, P.E., **Brodie, E.L.**, Conrad, M.S., Hubbard, S.S., Christensen, J.N., Joyner, D., Borglin, S.E., Chakraborty, R., Williams, K.H., Peterson, J.E., Chen, J., Brown, S.T., Tokunaga, T.K., Wan, J., Firestone, M., Newcomer, D.R., Resch, C.T., Cantrell, K.J., Willett, A. and S. Koenigsberg. 2008. In Situ Long-Term Reductive Immobilization of Cr(VI) in Groundwater Using 13C-Labeled Slow-Release Lactate. Environmental Science & Technology, 42:8478-8485.
10. Chivian, D., **Brodie, E. L.**, Alm, E. J., Culley, D. E., DeSantis, T. Z., Gehrung, T. M., Lapidus, A., Lin, L.-H., Lowry, S., Moser, D. P., Richardson, P., Southam, G., Wanger, G., Pratt, L. M., Andersen, G. L., Hazen, T. C., Brockman, F. J., Arkin, A. P. and T. C. Onstott. 2008. Environmental genomics reveals a single-species ecosystem deep within Earth. Science, 322:275-278.
11. Wan, J., Tokunaga, T., Kim, Y., **Brodie, E.**, Daly, R., Firestone, M. and Hazen, T. 2008. Effects of Organic Carbon Supply Rates on Mobility of Previously Bioreduced Uranium in a Contaminated Sediment. Environmental Science & Technology, 42:7573-7579.
12. Wrighton, K.C., Agbo, P. Warnecke, F., Weber, K.A., **Brodie, E.L.**, DeSantis, T.Z., Hugenholtz, P., Andersen, G.L. and J. D. Coates. 2008. A Novel Ecological Role of the Firmicutes Identified in Thermophilic Microbial Fuel Cells. ISME Journal, Advance Online Publication: 10.1038/ismej.2008.48.
13. West, K. A., D. R. Johnson, P. Hu, T. Z. DeSantis, **E. L. Brodie**, P.K.H. Lee, H. Feil, G. L. Andersen, S. H. Zinder and L. Alvarez-Cohen. 2008. "Comparative Genomics of Dehalococcoides ethenogenes 195 and a Dehalococcoides-Containing Enrichment Culture", Applied and Environmental Microbiology, 74:3533-40.
14. Johnson, D. R., **E. L. Brodie**, A. E. Hubbard, G. L. Andersen, S. H. Zinder, and L. Alvarez-Cohen. 2008. Temporal Transcriptomic Microarray Analysis of the Adaptation to Growth-Limiting Conditions in Dehalococcoides ethenogenes Strain 195, Applied and Environmental Microbiology, 74:2864-72.
15. Lynch, S.V., Yang, K., **Brodie, E.L.**, MacDougall, C., Andersen, G.L. and J.P. Wiener-Kronish. 2008. Culture-independent bacterial population analysis – Clinical implications for respiratory and other infections. Current Respiratory Medicine Reviews, 4, 35-39.

16. McClean, L.C.W., Pray, T.J., **Brodie, E.L.**, Onstott, T.C. and G. Southam. 2007. Mineralogical, Chemical and Biological Characterization of an Anaerobic Biofilm Collected from a Borehole in a Deep Gold Mine in South Africa. *Geomicrobiol. J.* 24, 491-504.
17. Moissl, C., La Duc, M.T., Osman, S., **Brodie, E.L.**, DeSantis, T.Z., Dekas, A. and K. Venkateswaran. 2007. Geographical Variations of Molecular Bacterial Communities Associated with Spacecraft Assembly Clean Rooms. *FEMS Microbiol. Ecol.* 61, 509-521.
18. Lynch, S.V., Dixon, L., Benoit, M.R., **Brodie, E.L.**, Keyhan, M., Hu, P., Ackerley, D.F., Andersen, G.L. and A. Matin. 2007. Role of the *rapA* gene in controlling antibiotic resistance of *Escherichia coli* biofilms. *Antimicrobial Agents and Chemotherapy.* 51, 3650-3658.
19. Flanagan, J.L.* , **Brodie, E.L.***, Weng, L., Lynch, S.V., Wiener-Kronish, J.P. and J. Bristow. 2007. Loss of Bacterial Diversity during Antibiotic Treatment of Intubated Patients Colonized with *Pseudomonas aeruginosa*. *J. Clin. Microbiol.* 45, 1954-1962. (* denotes equal contribution)
20. Montllor Curley, C., **Brodie, E.L.**, Lechner, M.G. and A.H. Purcell. 2007. Exploration for facultative endosymbionts of the glassy-winged sharpshooter (Hemiptera:Cicadellidae). *Ann. Entomol. Soc. Am.* 100, 345-349.
21. DeSantis, T.Z., **Brodie, E.L.**, Moberg, J.P., Zubietta, I.X., Piceno, Y.M. and G.L. Andersen. 2007. High-density universal 16S rRNA microarray analysis reveals broader diversity than typical clone library when sampling the environment. *Microb. Ecol.* 53, 371-383.
22. **Brodie, E.L.**, DeSantis, T.Z., Moberg-Parker, J.P., Zubietta, I.X., Piceno, Y.M. and G.L. Andersen. 2007. Urban aerosols harbor diverse and dynamic bacterial populations. *Proc. Natl. Acad. Sci. USA* 104, 299-304.
23. Lin, L.-H., Wang, P.-L., Rumble, D., Lippmann-Pipke, J., Sherwood Lollar, B., Boice, E., Pratt, L., **Brodie, E.L.**, Hazen, T. C., Andersen, G. L., DeSantis, T.Z., Moser, D. P., Kershaw, D. and T. C. Onstott. 2006. Long term biosustainability in a high energy, low diversity crustal biome. *Science* 314, 479-482.
24. **Brodie, E.L.**, DeSantis, T.Z., Joyner, D.C., Baek, S., Larsen, J.T., Andersen, G.L., Hazen, T.C., Herman, D.J., Tokunaga, T.K., Wan, J.M. and Firestone, M.K. 2006. Application of a high-density oligonucleotide microarray approach to study bacterial population dynamics during uranium reduction and reoxidation. *Appl. Environ. Microbiol.* 72:6288-6298.
25. DeSantis, T.Z., Hugenholtz, P., Keller, K., **Brodie, E.L.**, Larsen, N., Piceno, Y.M., Phan, R. and G.L. Andersen. 2006. NAST: A multiple sequence alignment server for comparative analysis of 16S rRNA genes. *Nucleic Acid. Res.* 34(Web Server issue): W394–W399
26. DeSantis, T.Z., Hugenholtz, P., Larsen, N., Rojas, M., **Brodie, E.L.**, Keller, K., Huber, T., Dalevi, D., Hu, P. and G.L. Andersen. 2006. greengenes: Chimera-checked 16S rRNA gene database and workbench compatible with ARB. *Appl. Environ. Microbiol.* 72:5069-72.
27. Kennedy, N., Brodie, E.L., Connolly, J. and N. Clipson. 2006. Seasonal influences on fungal community structure in unimproved and improved upland grassland soils. *Can. J. Microbiol.* 52:689-694.
28. Abuelencia, C. B., Wyborski, D. L., Garcia, J., Podar, M., Chen, W., Chang, S. H., Chang, H. W., Watson, D., **Brodie, E.L.**, Hazen, T.C. and M. Keller. 2006. Environmental whole-genome amplification to access microbial diversity in contaminated sediments. *Appl. Environ. Microbiol.* 72:3291-3301.
29. Hu, P., **Brodie, E.L.**, Suzuki, Y., McAdams, H.H. and G.L. Andersen. 2005. Whole-genome transcriptional analysis of heavy metal stresses in *Caulobacter crescentus*. *J. Bacteriol.* 187:8437-8449.
30. Tokunaga, T.K., Wan, J.M., Pena, J., **Brodie, E.L.**, M.K. Firestone, T.C. Hazen, S.R. Sutton, A. Lanzotti and M. Newville. 2005. Uranium reduction in sediments under diffusion-limited transport of organic carbon. *Environ. Sci. Technol.* 39:7077-7083.

31. Wan, J. M., Tokunaga, T. K., **Brodie, E.**, Wang, Z. M., Zheng, Z.P., Herman, D., Hazen, T.C., Firestone, M.K. and S. R. Sutton. 2005. Reoxidation of bioreduced uranium under reducing conditions. Environ. Sci. Technol. 39:6162-6169.
32. Lynch, S. V., **Brodie, E.L.** and A. Matin. 2004. Role and regulation of sigmaS in general resistance conferred by low-shear simulated microgravity in *Escherichia coli*. J. Bacteriol. 186:8207-8212.
33. Kennedy, N., **Brodie, E.L.**, Connolly, J. and N. Clipson. 2004. Impact of lime, nitrogen and plant species on bacterial community structure in grassland microcosms. Environ. Microbiol. 6:1070:1080.
34. **Brodie, E.**, Edwards, S. and N. Clipson. 2003. Soil fungal community structure in a temperate upland grassland soil. FEMS Microbiol. Ecol. 45:105-114.
35. **Brodie, E.**, Edwards, S. and N. Clipson. 2002. Bacterial community dynamics across a floristic gradient in a temperate upland grassland ecosystem. Microb. Ecol. 44:260-270.

Book chapters

Andersen, G. L., Piceno, Y. M., DeSantis, T. Z., and **E. L. Brodie** (2006) What DNA Microarrays Can Tell Us About Bacterial Diversity: A New Light on an Old Question. In M. J. Bailey (ed.), *Phyllosphere Microbiology*, Oxford University Press, Oxford, U.K.